

AMENDMENTS TO THE SPECIFICATION

Please substitute pages 9 and 19 of the specification enclosed herewith for the corresponding pages on file.

the time that the manual mode is used, but for reasons set forth hereinbefore, it is preferable that such a clutch not be included.

In the preferred embodiment of the drive of the invention, there is a mechanically releasable coupling between the motor drive member and the drive shaft 2. The pinion gear 39 has teeth engaging the teeth of a specially formed intermediate gear 40 which has axial projections 40a which can be received in circumferential slots 10A in an internally toothed gear 9. The internal teeth of the gear 9 interengage with the teeth on the driving gear 7 and the gear 9 is axially slidable with respect to the gear 7. Until moved toward the gear 7 by rods 11 (hereinafter described), the gear 9 is urged toward the gear 40 by a spring 13 so that the projections 40a are in the slots 10A. As the gear 40 is rotated by the gear 39, and hence, the motor 33, the projections 40A cause the gear 9 to rotate which, in turn, causes the drive gear 7, and hence, the shaft 2, to rotate.

When the gear 9 is moved toward the gear 7 by a sufficient amount, the projections 40a are out of the slots 10A, and therefore, rotation of the gear 40 does not cause rotation of the gear 7 and the shaft 2 and conversely, rotation of the shaft 2 does not cause rotation of the gear 40, the gear 39 and the rotor shaft 41.

The lever 15 has a threaded projection 15a and slidably receives a plunger 16 secured to the knob 17 and biased toward the wheel 20 by a spring 18. By pulling the knob 17 in the direction away from the wheel 20, the plunger 16 is pulled out of an opening 28 in the wheel 20 permitting the lever to be rotated counterclockwise from the position shown in Fig. 1 (electrical mode) to the position shown in Fig. 3 (manual mode). The projection 15a is rotatably mounted on the shaft 2.

A follower 19 with internal threads which mate with the threads on the projection 15a is mounted on the projection 15a. The follower 19 has ears 19a which are slidably received in axial slots 29. The follower 19 also has axial projections 19b for purposes hereinafter described. The threads on the projection 15a and internally of the follower 19 act as cam means for axially moving the follower 19. Thus, in the electrical or automatic mode (Figs. 1 and 2) of the lever 15, the follower 19 is moved toward the lever 15 and in the manual mode (Fig. 3), the follower 19 is moved away from the lever 15 by movement of the lever counterclockwise 270° around the axis 2a.

The wheel 20 is spaced from the bearing plate 43 by a sleeve 23. When the lever 15 is in the electrical, or automatic mode, position, the wheel 20, the follower 19

corresponding wires 71, 72 and 76. Zener diodes 149A and 150 protect the sensor 148 with respect to overvoltages.

Fig. 9 is a circuit diagram illustrating the circuits and devices which can be within the control box 86 (see Fig. 1) and their electrical connections to the motor control 74. The indicator lights 90-93 can, for example, light emitting diodes electrically connected to the circuits in the control box 74 through current limiting resistors 148, 149, 150 and 151 and a connector 152. The lights 90-93 can provide light of different colors, e.g. 90 and 92 can emit red light, 93, green light and 91, yellow light.

In some railway car systems, the brakes are applied and released using radio frequency, electromagnetic signals transmitted in free space from the locomotive to a receiver of such signals at the railway cars. The parking brake drive of the invention can be similarly actuated by transmitting such signals from the locomotive or from some other location, e.g. from a hand held transmitter.

Fig. 10 illustrates schematically equipment for actuating the brake drive without an electrical cable interconnecting the motor control 74 and manual switches for applying and releasing the brakes. Thus, as illustrated in Fig. 10, such equipment comprises a known type of transmitter 153 which transmits radio frequency electromagnetic energy signals in free space which is received by a known type of receiver 144 154. The receiver can be included in the motor control 74 or can be a separate unit. The transmitter transmits a first signal when the “apply” button 155 is manually operated and a second signal when the release button 156 is manually operated. Operation of the buttons 155 and 156 can, for example, operate switches which determine the signal transmitted. The signals transmitted can, for example, be of different frequencies, one for “apply” and a different one for “release”, or the signals can be differently modulated.

At the receiver 154, the received signals are used, like the switches 88 and 89, to determine which of the lines, 58 or 66, voltages are applied to control the motor 33. The receiver 154 can be connected to the connectors 55 (Fig. 7a) and 104 (Fig. 7b) by a connector 107 and electrical wires 108.

ELECTRICAL BRAKE APPLICATION

When the parking brake is applied in the electrical mode, the operator will press and momentarily hold the apply button 88. An electrical signal nominally 74 volts DC, will be sent to the parking brake controller 74 through the cable 87. The